REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1, 3-12 and 21, 22, 24 and 25 are presently pending in this application, Claims 2, 13-20 and 23 having been canceled, Claims 1, 9 and 10 having been amended and Claims 24 and 25 having been newly added by the present amendment.

In the outstanding Office Action, Claim 23 was objected to because of informalities; Claims 13-20 and 23 were rejected under 35 U.S.C. §112, second paragraph, for being indefinite; Claims 1, 3-8, 13-21 and 23 were rejected under 35 U.S.C. §102(b) as being anticipated by Yamada et al. (U.S. Patent 6,159,862); Claims 1-4, 9, 11, 13-17, 19, 21 and 23 were rejected under 35 U.S.C. §102(a) as being anticipated by JP 2001-127039 (hereinafter "JP '039"); and Claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over JP '039 in view of Yamada et al. However, Claims 10 and 22 were indicated as including allowable subject matter.

First, Applicant acknowledges with appreciation the indication that Claims 10 and 22 include allowable subject matter. Accordingly, Claim 10 has been rewritten in its independent form, and Claim 22 depending from Claim 10 is maintained in its previous form.

With regard to the rejection under 35 U.S.C. §112, second paragraph, Applicants respectfully request that Claims 13-20 and 23 be canceled without prejudice.

Claims 1 and 9 have been amended and Claims 24 and 25 have been newly added herein. These amendments and additions in the claims are believed to find support in the specification, claims and drawings as originally filed, and thus no new matter is believed to be added thereby. If, however, the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work in a joint effort to derive mutually satisfactory claim language.

Before addressing the outstanding Office Action, a brief summary of Claim 1 as currently amended is believed to be helpful. Claim 1 according to the present invention is directed to an etching method for etching a silicon-containing oxide according to a pattern shape of a mask by using a gaseous mixture of gas containing carbon and fluorine, oxygen gas and inert gas, and in the etching method, recesses are formed in the silicon-containing oxide by an etching carried out under a condition that a ratio of a total flow rate of the gas containing carbon and fluorine and the oxygen gas to a flow rate of the inert gas ((a flow rate of the gas containing carbon and fluorine + a flow rate of the oxygen gas)/a flow rate of the inert gas) is smaller than 0.015, the recesses having approximately planar bottom portions formed of the silicon-containing oxide and approximately vertical sidewall portions formed of the silicon-containing oxide, and angled portions formed by the sidewall portions and the bottom portions being substantially right angled; and a formation of narrow groove shaped microtrenches is suppressed at the bottom portion sides of the angled portions.

Yamada et al. and JP '039 are directed to a semiconductor processing method and system using C_5F_8, and a method for manufacturing a semiconductor device, respectively. Nevertheless, neither Yamada et al. nor JP '039 teaches or suggests "recesses are formed in the silicon-containing oxide by an etching carried out under a condition that a ratio of a total flow rate of the gas containing carbon and fluorine and the oxygen gas to a flow rate of the inert gas ((a flow rate of the gas containing carbon and fluorine + a flow rate of the oxygen gas)/a flow rate of the inert gas) is smaller than 0.015, the recesses having approximately planar bottom portions formed of the silicon-containing oxide and approximately vertical sidewall portions formed of the silicon-containing oxide, and angled portions formed by the sidewall portions and the bottom portions being substantially right angled" as recited in

amended Claim 1. On the other hand, Yamada et al. describes a flow rate ratio of 0.0167,[1] and JP '039 describes a flow rate ratio of 0.015.[2] Therefore, the subject matter recited in Claim 1 is distinguishable from Yamada et al., and because neither Yamada et al. nor JP '039 discloses the formation of recesses as recited in Claim 1, even the combined teachings of these cited references are not believed to render the subject matter recited in Claim 1 obvious.

Turning to Claim 9, the outstanding Office Action asserts that JP '039 discloses two cycle etching in its paragraph 0018, thereby rendering Claim 9 anticipated by JP '039. Applicants, however, respectfully traverse the outstanding rejection based on JP '039, and submit that JP '039 does not teach or suggest "recesses are formed in *the silicon-containing oxide* by the first and the second steps of etching [i.e., "a first step of etching the silicon-containing oxide by setting a ratio of a total flow rate of the gas containing carbon and fluorine and the oxygen gas to a flow rate of the inert gas ((a flow rate of the gas containing carbon and fluorine + a flow rate of the oxygen gas)/a flow rate of the inert gas) as a first value; and a second step of etching the silicon-containing oxide by setting the ratio of the total flow rate of the gas containing carbon and fluorine and the oxygen gas to the flow rate of the inert gas ((the flow rate of the gas containing carbon and fluorine + the flow rate of the oxygen gas)/the flow rate of the inert gas) as a second value smaller than the first value,"], the recesses having approximately planar bottom portions formed of the silicon-containing oxide and approximately vertical sidewall portions formed of the silicon-containing oxide, and angled portions formed by the sidewall portions and the bottom portions being substantially right angled" as recited in Claim 9 (emphasis added in italic). That is, in the etching method according to Claim 9, the two step process is performed on an oxide, whereas in JP '039, the first etching step is performed on an oxide and the second etching step is

[1] See, for example, Yamada e t al., column 10, lines 31-43, and column 5, lines 49-54.
[2] See, for example, JP '039, paragraph [0018].

performed on a nitride.[3] As such, the subject matter recited in Claim 9 is distinguishable from JP '039.

For the foregoing reasons, Claims 1, 9 and 10 are believed to be allowable. Furthermore, since Claims 3-8 and 11, 12, 21, 22, 24 and 25 depend directly or indirectly from one of Claims 1, 9 and 10, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 3-8 and 11, 12, 21, 22, 24 and 25 are believed to be allowable as well.

In view of the amendments and discussions presented above, Applicant respectfully submits that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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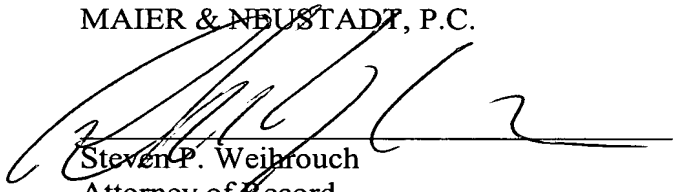

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[3] See, for example, JP '039, paragraph [0005].